DATA QUALITY AND DUE PROCESS IN LARGE INTERORGANIZATIONAL RECORD SYSTEMS

As societies have become more dependent on information systems to conduct and record transactions between organizations and individuals, interorganizational computer systems have become a widely used method of coordinating the actions of independent organizations. This article examines the quality of data in one important interorganizational system—the criminal-record system of the United States.

KENNETH C. LAUDON

Since the late 1960s, state and federal governments have built a number of interorganizational computer-based information systems to service the needs of the criminal-justice system [23]. Decisions concerning pretrial release and bail, career-criminal prosecution, and "selective incapacitation" of individuals thought likely to commit a crime in the future (on the basis of a criminal record) rely heavily on computerized criminal-history record systems. Similarly, police street detentions are often based on computerized warrant systems, and increasingly, securing employment in many occupations may depend on a criminal-record check [8, 17]. This article will focus on the quality of information in these systems, and how it can affect a person's constitutional rights.

The Privacy Act of 1974, along with other federal regulations, has firmly established the importance of maintaining accurate, complete, and unambiguous information in computerized record systems. Likewise, the concept of due process assumes that organizations will not treat individuals arbitrarily, capriciously, or with malice. Thus, information systems containing inaccurate, incomplete, or ambiguous information not only violate society's notion of fairness in dealings with individuals, they also threaten specific due-process guarantees that are afforded by the Constitution and statute [13].

The problem of maintaining high-quality records in an information system is magnified in an interorganizational computer system. Some interorganizational systems only permit the sharing of *voluntarily* submitted information or notices—as in an electronic bulletin board. In this instance, there is no central authority or management, few standards for the content and format of the information, weak incentives for compliance with system rules, and little concern for accuracy. Other interorganizational systems are based on a central library model where there is strong management control over data entry, active management of files, powerful incentives for participants to comply with system standards, and sanctions for noncompliance.

Systems also differ in terms of their relation to the public: Some inform on decisions of critical life importance, whereas others involve individual convenience. A national criminal-history system, for example, affects matters of critical life importance; an airline-reservation system deals with matters of convenience; a credit-reporting system may fall in between.

Systems vary in terms of their visibility and openness to the public: An airline-reservation system operates in such a way that erroneous information can be spotted easily, but national criminal-history systems are not as equally visible to the individuals involved. Exactly what information is on file and who used it—when and where—are questions not easily answered by criminal-record systems.

The obvious connection between the structural characteristics of interorganizational systems and the nature of the decisions they inform is that systems dealing with matters of critical life importance—and which are less "open" or "visible" to the public—should be structured as central libraries with strong central management controls. Systems dealing with matters of convenience may be operated as bulletin boards—if only because they are more self-correcting.

DUE-PROCESS REQUIREMENTS

Over the years, the courts and legislatures have addressed the problems caused by poor-quality records in administrative processes. The findings of Townsend

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versus Burke in the U.S. Supreme Court illustrate the position of the courts:

> This petitioner was sentenced on the basis of assumptions concerning his criminal record which were materially untrue. Such a result, whether caused by carelessness or design, is inconsistent with due process of law and such a conviction cannot stand . . . . It is the careless or designed pronouncement of sentence on a foundation so extensively and materially false, which the prisoner had no opportunity to correct by the services which counsel would provide, which renders the proceeding lacking in due process. (Townsend versus Burke, 334 U.S., 1948)

More recent court rulings reflect the pervasive use of the criminal records in bail and other proceedings:

> Plaintiffs are clearly and systematically being deprived of due process in violation of the Fourteenth Amendment to the U.S. Constitution, and of the right of effective assistance of counsel as guaranteed by the Sixth Amendment, whenever rap sheets containing erroneous, ambiguous, or incomplete data with respect to prior arrests and dispositions are submitted to courts at arraignment sessions for use in connection with bail determination. The Eighth Amendment right to reasonable bail is also thus denied . . . neither plaintiff nor their counsel is capable, as a practical matter, of correcting errors, resolving ambiguities, or supplying missing information to cure defects contained in rap sheets . . . the result is frequently the impositions of bails in amount exceeding those which would be set if complete and accurate information were available to the courts. [16]

Such concerns for the accuracy and completeness of criminal-record information are reflected in federal regulations calling for complete records that "must contain information of any dispositions occurring within a state within 90 days after the disposition has occurred" [to prevent dissemination of "arrest only" data] (Title 28, U.S.C.). These regulations also call for minimal errors in records, and procedures to ensure this result by a "process of data collection, entry, storage, and systematic audit that will minimize the possibility of recording and storing inaccurate information . . . and upon finding inaccurate information [the state or federal record system] shall notify all criminal justice agencies known to have received such information" (Title 28, United States Code of Federal Regulations, 1975).

Despite the growing importance of data quality in large record systems, methodologies for examining record quality have not been established, and few systematic research efforts have attempted to ascertain empirical levels of data quality. An exception is the state and federal benefit programs where Congress has mandated specific error levels and where agencies have undertaken extensive "quality assurance" programs to analyze record and decision-making qualities (United States Senate, 1984 and [2]). These studies focus on payment errors and are not applicable to other systems—such as criminal records.

In the absence of empirical research, legislative bodies have been forced to rely on vague and ambiguous directives such as those found in the Privacy Act of 1974, which direct all federal agencies to "maintain all records which are used by the agency in making any determination about any individual with such accuracy, relevance, timeliness, and completeness as is reasonably necessary to assure fairness to the individual in the determination" (P.L. 93-579: The Privacy Act of 1974, Section 3, [e] and [6]). With the exception of arbitrary standards adopted by legislative bodies for benefit programs, there are no really enforceable standards of data quality, accuracy, or completeness in governmental systems [7].

TYPES OF CRIMINAL RECORDS AND RECORD SYSTEMS

In this article, we will examine two kinds of criminal-record systems: computerized criminal-history (CCH) records and computerized warrant records (Wanted-Person System—WPS). A criminal-history record is a record of arrests, court dispositions, and sentencing. It is originated by the police at arraignment; other record segments are supposed to be submitted by the courts and correctional agencies. There are about 195 million criminal-history records in the United States: 40 million records are maintained by the states, 32 million by federal agencies, and the rest by local agencies. About 18.6 million records are computerized at state and federal levels [8, 11]. About one-third of the labor force has a criminal-history record [18].

As of 1984, 36 states operate CCH systems, and the Federal Bureau of Investigation (FBI) operates two systems: the National Crime Information Center CCH (NCIC-CCH) System and the Identification Division (Ident). NCIC-CCH is an on-line file of approximately 2 million records. Ident is a semiautomated, largely manual file of 22–24 million records.

In addition to their use in law enforcement programs, CCH records are increasingly being used for screening employees in both the public and private sector. In some states, this is the fastest growing use. At the federal level, 53 percent of Ident's use of records is for employment screening [8].

A second kind of record is the computerized warrant. Currently, 35 states operate computerized WPSs, and the FBI operates a national WPS (NCIC-WPS). The federal system contains 127,000 warrants for arrests issued by local, state, federal, and military agencies.

Warrants are issued by the police or the courts, either because the police have a reason to believe the person was involved in a crime, or because the courts have determined that the person is in violation of judicial process (e.g., failure to appear, jumped bail, violated parole). Warrants are supposed to be removed from systems when the person is arrested or when the warrant is "vacated" or canceled. As we will see below, failing to remove invalid warrants from WPSs is a critical weakness.

Warrant systems are used primarily by police in both prearrest and postarrest situations, and by prosecutors in determining bail. Due to advances in telecommunications, police in most jurisdictions now have access to local, state, and federal wanted/warrant systems from the patrol car. WPSs are socially significant because

they directly affect the behavior of police at a critical moment in the arrest process. The arrest event, as described by many authors, is at times fraught with ambiguity and danger for both the police officer and the individual [15, pp. 45–48; 22]. The availability of warrants to police officers on the beat may increase the frequency of "stop and question" behavior, which may be perceived by individuals as harassment. Moreover, stopping and questioning individuals can turn into a lengthy detention as police officers check a variety of wanted and stolen property files. This, in turn, places a strain on Fourth Amendment protections from unreasonable police searches. While a 5-minute stop on the street sounds reasonable, stops of 50 minutes or five hours are less reasonable, but increasingly common (People versus McGaughran, 1979; People versus Harris, 1982). On the other hand, the ready availability of warrant and wanted information directly contributes to the ability of the police to remove dangerous criminals from the street, and to return them to a jurisdiction where they are wanted for criminal actions.

RESEARCH BACKGROUND

The research reported in this article was carried out from 1979 to 1984 and was funded by the Office of Technology Assessment (U.S. Congress). A preliminary assessment had already established in 1978 that a critical drawback to developing a national CCH system was the allegation that existing state and federal record systems contained high levels of inaccurate, ambiguous, and incomplete information [10]. Congress was especially concerned that the FBI's computerized WPS contained a significant number of cleared, vacated, or inaccurate warrants that potentially could lead to false arrests and the violation of individual rights of due process. My research sought to empirically and systematically establish the levels of data quality in the FBI's nonautomated Ident (containing 22–24 million criminal-history records); the automated NCIC-CCH system (containing 1.9 million CCH records); the criminal-history record systems of a western, a midwestern, and a southern state; and the NCIC-WPS. (The three state CCH systems were included in the data-quality research because any future national CCH system will depend on the criminal-history information generated initially by the states. Thus it is important to obtain estimates of the levels of record quality in these state systems.)

METHODOLOGY

The three methods generally used to examine data quality in large files are surveys of end users or clients, samples of entire record files, and samples of active or current cases. Surveys of end users typically measure "perceptions" of data quality and are fraught with problems of recall, self-report bias, and serious underestimates [14]. Surveys of entire files carried out by large agencies also contain inherent errors. Many persons on file are no longer active, some are deceased, and the method fails to account for eligible persons erroneously denied benefits [4].

Given the purpose of this research—which is understanding the quality of information currently being used by criminal-justice decision makers—the preferred method is a survey of active cases. For each of the systems examined, a sample of current cases was taken, and the records were compared to hard-copy original documents of known accuracy. The FBI Ident, NCIC-CCH, and NCIC-WPS samples were essentially random samples of around 400 cases each. In the three states, approximately 500 of the most recently prosecuted cases were selected from the files of district attorneys and state record systems. In some cases, this involved reviewing the prosecutions for an entire year (for a more detailed description of the methodology and procedures to protect the privacy of individuals, see [5] and [8]).

Dimensions of Record Quality in Criminal-History Systems

Previous research [3], as well as over 100 interviews I conducted with criminal-justice personnel at the state, local, and federal level, has identified the following significant dimensions of record quality for criminal-record systems:

Record Completeness. Criminal records that indicate an arrest but no formal court disposition recorded within one year of the arrest date are considered "incomplete" records. This was believed to be the single largest form of record-quality problem and is singled out in the tables as "No court disposition." Other forms of incomplete records are those that show conviction of "attempt," but where the specific crime is not stated; records that show sentencing information, but fail to indicate conviction information; and records in which correctional data are missing, but other data are present.

Record Inaccuracy. Records are inaccurate when the arrest, court disposition, or sentencing information on a CCH record does not correspond with the actual manual court records.

Record Ambiguity. A record is ambiguous when it shows more charges than dispositions or more court dispositions than charges. Other ambiguities that also arise are dates that do not correspond, or a number of arrest charges followed by a single court disposition where it is not clear for which particular crime the individual was convicted.

Record Quality in Warrant Systems

The record-quality analysis of the NCIC-WPS focused on the extent to which warrants listed in the computerized file were still *active* warrants (meaning that the local agency that submitted the warrants to the federal system still wanted the person). If the computerized record correctly reflected that a warrant was indeed outstanding, it was labeled a *warrant outstanding.* If the local agency had cleared or vacated the warrant (meaning that the person had already been arrested for that crime or that, for one reason or another, the local agency no longer wanted the person), the warrant was

considered *cleared/vacated* and an invalid warrant—that is, a warrant that should not be listed on the automated national file. Other record-quality problems encountered during the course of the research were that the originating local agency had no record of ever having issued a warrant for the person listed on the automatic file, and, in other instances, that the person was wanted by a local agency, but no warrant for a specific crime could be located. These warrants are also considered invalid.

Generalization

The results from Ident are technically generalizable to the approximately 2.3 million annual requests from state/local agencies; the NCIC-CCH findings to the 1.8 million annual disseminations; the NCIC-WPS to the 127,500 persons resident on the file. The state findings, because they are not representative samples of state systems, can best be thought of as indicative of the kinds of record levels actually occurring in large urban areas of the states examined.

In the federal CCH systems, it was impossible to verify each of the arrests on each record because of resource constraints. Therefore, the first arrest event more than one year old was verified per record. This permitted the federal system a minimum of one year to obtain court disposition, sentencing, and related information. In the state systems, all arrest events more than one year old were verified.

In making inferences from the samples to the respective populations, the confidence interval is given by

$$\pi = P \pm 1.96 \times \sqrt{PQ \div N}$$

where

P = the observed sample proportion,
Q = $1 - P$,
1.96 = the value of Z (standard error measure) appropriate to a 95 percent confidence interval, and
N = the number of responses to a given measure.

FINDINGS

FBI Criminal-History Files

The results of the data-quality study of FBI criminal-history files are presented in Table I. As noted above, the statistical results presented here reflect current disseminations from both the NCIC/CCH and the FBI Ident. At the time of our survey (summer, 1979), there were 2.35 million disseminations to state and local agencies from the Ident and approximately 360,000 disseminations from the NCIC/CCH file.

Our analysis indicates that 25.7 percent of the Ident records were complete, accurate, and unambiguous, whereas 74.3 percent of the records exhibited some sig-

TABLE I. Data Quality of FBI Criminal-History Systems: NCIC-CCH and Ident Criminal-History Records

	NCIC-CCH	Ident criminal-history records
Arrests in sample	400	400
Positive verification	256	235
Response rate	64.0%	58.5%
Arrests not verifiable because		
Pending or sealed	6	19
No record locatable*	54	37
No prosecution of arrest	10	7
Fugitive	1	1
No arrest data	24	—
	95 (37.1%)	64 (27.2%)
Total arrest cases verified	161	171
Characteristics of verified arrest case		
No disposition reported	27.9% (45)	40.9% (70)
Incomplete record	0.6% (1)	2.3% (4)
Inaccurate record	16.8% (27)	10.5% (18)
Ambiguous record	2.5% (4)	6.4% (11)
Combined problems	6.2% (10)	14.1% (24)
Complete, accurate, and unambiguous	45.9% (74)	25.7% (44)
Total	100.0% (161)	100.0% (171)

* In situations of "no record locatable," this generally reflected a police disposition of the arrest; for example, the person was released prior to presenting to a district attorney. This was removed from further analysis even though it might have been included as a "no disposition recorded"; hence, estimates of record characteristics are conservative.

1. If *no disposition* was reported ("record blank"), the data analysis exempted the record from further consideration even though it might have other problems of accuracy and ambiguity. Estimates of these features are therefore conservative.
2. A record was *incomplete* if it failed to record conviction or correctional data.
3. A record was *inaccurate* if it incorrectly reflected the court records of disposition, charges, or sentence.
4. A record was *ambiguous* if it indicated more charges than dispositions, but did not specify charges of conviction; *or* if a record indicated more dispositions than charges; *or* if for a number of reasons the record was not interpretable (see text).
5. A record had *combined problems* if it indicated more than one of the four logically possible permutations of incompleteness, inaccuracy, or ambiguity.

nificant quality problems. Translated to the population of 2.35 million annual disseminations, our results indicate that 1.75 million (plus or minus 6 percent) of the disseminations had a significant quality problem. The most common problem was lack of court disposition information, followed by inaccurate recording of court disposition information (where present at all), ambiguity of record, or some combination of the above.

Our analysis of the NCIC-CCH system found 45.9 percent to be complete, accurate, and unambiguous, and 54.1 percent with some significant quality problem. Translated to the entire population of 360,000 disseminations, approximately 165,240 (plus or minus 6 percent) were complete and accurate, and 194,760 (plus or minus 6 percent) were incomplete and/or inaccurate. Here, as in the manual criminal-history file of Ident, the most frequent problem involves the lack of disposition data followed by the accuracy of the disposition recorded.

FBI WPS

The statistical results of the WPS study reflect the condition of the Wanted-Persons File at the time of the study, although there is little reason to believe (with respect to the data-quality characteristics outlined here) that the results vary from month to month (see Table II). Our research found the following:

- Of the warrants, 11.2 percent were no longer valid. Generalized to the population of warrants in the entire file, 14,280 (plus or minus 3 percent) were invalid by virtue of being vacated/cleared, having no local record, or being not specifiable.
- Of the warrants, 93.7 percent were accurate in their classification of offense, and 6.6 percent were inaccurate. Generalized to the population of warrants, approximately 8,033 (plus or minus 3 percent) were inaccurate in this respect.
- A significant number of warrants appear to be nonprosecutable on the basis of age. Of the warrants,

TABLE II. Wanted-Persons-File Summary Analysis

Population of warrants	127,500
Sample size	405
Originating agency response	394
Valid responses (complete information) (20 agencies were unable to account for the date on which warrants cleared)	374
Response rate	92%

Validity of Warrants

	Sample statistics	Population estimates
Valid warrants (affirmed to be outstanding or cleared during OTA research)	88.8% (332)	113,220 (±3.2%)
Invalid warrants (cleared or vacated or not verifiable by agency)	11.2% (42)	14,280 (±3.2%)
Total	100.0% (374)	

Breakdown of Validity

	Sample statistics	Population estimates
Valid warrant	85.8% (332)	—
Invalid warrant	11.2% (42)	—
Warrant cleared but still on file*	6.1% (23)	7,841 (±2.4%)
Agency had no record on warrant	4.3% (16)	5,483 (±2%)
Wanted but no warrant locatable	0.8% (3)	1,020 (±1%)

Accuracy of Offense Classifications

	Sample statistics	Population estimates
Compared to originating agency records, NCIC offense classification was		
Accurate	93.7% (342)	119,468 (±3%)
Inaccurate	6.3% (23)	8,033 (±3%)
Total	100.0% (365)	

Summary—Age of Warrants

	Sample statistics	Population estimates
Less than one year old	29.0% (114)	36,975 (±5%)
One to three years old	47.0% (185)	59,925 (±5%)
More than three years old	23.9% (94)	30,473 (±5%)
More than five years old	15.1% (59)	19,253 (±4%)
Five years or less old	84.9% (334)	108,248 (±4%)

* Warrant was cleared or vacated one year prior to sample date.

TABLE III. CCH Record Quality in Three State Systems

	Western state	Midwest state	Southern state
Individuals in sample	500	502	498
Total prior arrests	2733	985	1345
Total in-county arrests	2172	739	1002
Arrests not verifiable because			
Case pending	1	3	3
Record sealed	0	0	0
Docket not locatable	0	47	1
Municipal court disposition	8	—	0
Total in-county arrests verified	2163	689	998
Characteristics of CCH verified arrests			
No disposition reported	915 (42.3%)	107 (15.5%)	390 (39.1%)
Incomplete	531 (24.5%)	93 (13.5%)	215 (21.5%)
Inaccurate	16 (0.7%)	91 (13.2%)	2 (0.2%)
Ambiguous	57 (2.6%)	22 (3.2%)	32 (3.2%)
Combined problems	236 (10.9%)	35 (5.1%)	237 (23.7%)
Complete, accurate, and unambiguous	408 (18.9%)	341 (49.4%)	122 (12.2%)
Total	2163 (100%)	689 (100%)	998 (100%)

Notes:
1. Arrests were verified against local court records only if the arrests occurred within the prosecutorial district where the sample of individuals was drawn. See Task II for detailed analyses of coding sheets and samples.
2. If *no disposition* was reported on a CCH record ("record blank"), the data analysis exempted the record from further consideration even though these records had other problems of incompleteness, inaccuracy, or ambiguity. Hence, estimates of these features of records are conservative.
3. A record was *incomplete* if it failed to record conviction or correctional data.
4. A record was *inaccurate* if it incorrectly reflected the court records of disposition, sentence, or charges.
5. A record was *ambiguous* if it indicated in response to multiple charges a single plea of guilty, but did not specify of which charge (more charges than dispositions); *or* if more dispositions were recorded than charges; *or* if the record was for a number of reasons not interpretable (see text for explanation).
6. A record had *combined problems* if it reflected one or more of the four logically possible permutations of incompleteness, inaccuracy, or ambiguity.

23.9 percent are more than three years old, and 15.1 percent are more than five years old. It is generally believed by district attorneys interviewed in this research that warrants more than five years old are not capable of prosecution because of deceased and/or missing witnesses, as well as other difficulties. Warrants not considered prosecutable will not lead to extraditions, although they can lead to arrest or detention.

Our research also found that 74.4 percent of the warrants (in the population, 94,860 plus or minus 4 percent) were for nonindex crimes ("index crimes" are those generally considered by the FBI and others as the "most serious crimes": murder, manslaughter, rape, robbery, aggravated assault, burglary, larceny, and motor-vehicle theft). Only 25.6 percent of the warrants found in the FBI system involve index crimes. Many nonindex crimes are serious (probation/parole violation, drug crimes, kidnapping, etc., are indeed serious), yet the appearance in this sample of warrants for traffic violations, child neglect, property destruction, cruelty to animals, abandonment, etc., leads to the conclusion that perhaps as much as 7 percent of the warrant file (8,925 warrants plus or minus 5 percent) are sufficiently nonserious that the apprehension of the suspect would in all likelihood not lead to extradition or prosecution. Nevertheless, the outstanding warrant could lead to an arrest or detention if the suspect was stopped by the police.

Three State Criminal-History Systems

The findings of the state data-quality studies parallel those at the federal level. In the three state systems examined, the level of data quality ranges from only 12.2 percent of recently disseminated criminal-history records being accurate, complete, and unambiguous in a southeastern state, to 18.9 percent in a western state, to 49.4 percent in a midwestern state (see Table III). In all states, the most significant problem involves lack of disposition information, followed by incomplete records, inaccuracy of recorded dispositions, and ambiguity of information.

There is a considerable range in data quality among the states. However, the data-quality problems in state systems are far larger than is commonly known and more significant than heretofore imagined.

INTERPRETATION OF FINDINGS

We recognize the limitations of our sampling methods, their limited geographic coverage, and the lack of "benchmark" criteria. The most conservative interpretation of our research is that it is reasonable to believe that (1) constitutional rights of due process are not well protected in either manual or computerized criminal-history systems and federal wanted-person systems, and (2) the efficiency and effectiveness of any law enforcement or criminal-justice programs that use or rely on such records must be considerably impaired. The maintenance of due-process standards cannot be as-

sured in administrative processes that rely on fundamentally incomplete, ambiguous, and inaccurate information. Dissemination of incomplete records that indicate stigmatizing arrests but not exonerating dispositions tends to overstate the proven criminality of individuals and may result in denial of employment with little justification in law [8, 17]. With large variations in record quality from state to state, it would appear that constitutional protections apply unequally. Whatever faith existed before this study in individual access, review, and challenge mechanisms to protect the rights of privacy and due process must surely be weakened. Despite the availability of these legal remedies to individuals, it is clear that criminal-record systems are continuing to operate with considerable error.

The findings of our research on the NCIC-WPS are perhaps even more indicative of how a poorly managed national information system can affect constitutional guarantees of due process. Information in this file, unlike the information in a criminal-history file, can be and is routinely used as grounds for arrest or detention of individual citizens. It also should be noted that the FBI has in recent years prior to our research taken significant actions to improve the currency and accuracy of the Wanted-Persons File by systematically requesting originating agencies at the state and local levels to verify the currency and accuracy of warrants they have placed on the NCIC Wanted-Persons File. Nevertheless, the following facts have emerged from our research:

- In excess of 14,000 persons are at risk of being falsely detained and perhaps arrested, because of invalid warrants in this system.
- Eight thousand persons are at risk of being detained, and perhaps arrested, but subsequently neither extradited nor prosecuted because of the nonserious nature of their indicated offense.
- Nineteen thousand persons whose outstanding warrants are valid, but more than five years of age, are at risk of being detained, and perhaps arrested, but neither prosecuted nor extradited due to the age of the outstanding warrant.

Statistics such as these have provided the substance for a steady stream of newspaper articles and anecdotes reporting that the NCIC-WPS and related systems operated by most states violate the constitutional rights of a significant number of individuals.

MANAGING INTERORGANIZATIONAL RECORD SYSTEMS

The criminal-record system in the United States provides a potent example of problems with data quality in large interorganizational record systems and reflects the need for organizations to reduce uncertainty by sharing data on one another's actions.

It is apparent that the FBI systems described here are not appropriately structured. The FBI systems require the cooperation of more than 60,000 criminal-justice agencies throughout the country to properly update, correct, and verify record segments. Neither self-interest nor shared interest is present to bring about voluntary compliance. The Constitution segments power among police, prosecutors, courts, and correctional agencies; it further disperses power among local, state, and federal levels of government. History provides ample examples of conflict, not cooperation, among such agencies [5, 9, 15], and few will argue that the various agencies should be consolidated into a single national justice agency—as has been done in many European countries—for the sake of administrative convenience and efficiency. Interorganizational systems are supposed to provide a functional equivalent to bureaucratic centralization, yet it is obvious that this alternative carries with it the risk of exceptionally poor data quality and the potential for Constitutional harm.

Knowing the risks and consequences of operating in this milieu, one might expect the nominal managers of these computerized criminal-record systems, the FBI and the Department of Justice, to initiate strong management controls in the area of data quality. Some simple first steps would eliminate arrest records that did not contain a court disposition within one year of arrest (the state of Minnesota follows this rule). This would solve the problem of incompleteness. The FBI could initiate frequent data-quality audits (especially of the warrant file), reduce the gargantuan national criminal-history files by focusing only on serious offenders, and occasionally exercise the statutory authority of the attorney general to eliminate agencies and states from participation in information systems when they fail to comply with system standards [8].

However, even a moderately strong management posture would carry with it significant political risks. States might reject such actions as a violation of federalism—an illegitimate intrusion by the federal government into an area that the Constitution grants to the states. A worse consequence could result for the FBI if the individual states established their own interstate criminal-record network—essentially beyond federal controls—something they almost accomplished in the early 1970s [9]. At stake then is the FBI's historic place at the center of national criminal-record systems, a role that began in the 1920s.

Given this uncertain political environment, the FBI has imposed few data-quality controls over participants in its criminal-record systems. Despite severe congressional criticism over the years, the FBI did not conduct a comprehensive audit of its record systems [11, 12] until 1984. Owing partly to the findings of the research presented here, in 1984 the FBI began a limited program of audits in selected states of the "hot files"—such as Wanted Persons (warrants). Although the FBI had been highly critical of my research findings, its own findings, released in August 1985, found that about six percent of the warrants were invalid in 12 selected states. On a national basis, the FBI estimates that 12,000 invalid warrants are sent out per day [1]. This error rate is approximately one-half of that measured in our national sample. Like our own research, the FBI's investigations discovered enormous irregularities. In Mobile, Alabama, of 453 warrants supplied to NCIC

during the FBI's audit, 338 listed the height as 7 feet 11 inches, the weight as 499 pounds, and the hair as "XXX" [1].

Unlike the Social Security Administration, which conducts a 20,000-case sample of beneficiary records each month in order to control payment and process quality, the FBI does not know the quality of its own records [20]. From its inception in the 1920s, the accuracy and completeness of FBI criminal-history files have been entirely the responsibility of local contributing agencies. Computerization of these records in the 1970s did not change this management position. Every outgoing record from the FBI system clearly states that it is the responsibility of the user agency to verify the accuracy of records. Although never stated as a matter of public policy, the FBI operates in essence an electronic bulletin board [19, pp. 202–203, 368–374].

The FBI claims not to be responsible for the accuracy, currency, or completeness of the data it collects, stores, and disseminates. Yet, in the rush to arrest, prosecute, judge, and penalize the approximately 9 million criminal offenders arrested each year, verification by users is rarely undertaken. Numerous interviews with criminal-justice decision makers established that the records are taken "as is" and used directly in the decision-making process ([8] and Tatum versus Rogers, 1971). Although some jurisdictions have adopted (under court pressure) regulations requiring police to verify information, and to obtain a high degree of correspondence between computerized warrants and identification supplied by citizens, most jurisdictions do not have limitations on a police officer's use of computerized records. Following a class action suit initiated in 1980, the Los Angeles City Council agreed in 1984 to require a 72 percent correlation between a computer-listed warrant and a detained suspect before officers could gain access to a full warrant record (see [21]).

Public attitudes will be crucial in determining whether or not the FBI will exercise strong management controls over the interorganizational systems it nominally operates. Although most Americans want serious felons to be effectively brought to justice, most do not want a system where individuals are routinely denied due process. Most Americans mistakenly believe that the criminal-record systems apply only to a small group of violent felons and social outcasts. With 36 million persons (about one-third of the labor force) having such a record, we must recognize that criminal-record systems are apt to contain our own name and the names of our relatives. In the future, these record systems will become even more extensive. As one California official noted, "Soon nearly everyone in their lifetime will produce a criminal record of some kind, and the mere possession of a record will not mean much per se. It will be like a credit record" [8]. When this comes to pass, public attitudes may change as we begin to see how the records pertain to our own lives.

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CR Categories and Subject Descriptors: K.4.1 **[Computers and Society]**: Public Policy Issues; K.4.3 **[Computers and Society]**: Organizational Impacts; K.6.4 **[Management of Computing and Information]**: System Management

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Author's Present Address: Kenneth C. Laudon, Computer Applications and Information Systems Area, Graduate School of Business, New York University, New York, NY 10003.

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